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SOME OBSERVATIONS BEARING
ON THE
ETIOLOGY AND TREATMENT OF PSORIASIS,

by

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In the following thesis, which is based upon four cases of psoriasis spontaneously cured during different pregnancies, an attempt is made to show that the disease is probably due to some toxin produced by an error in metabolism acting on the nervous system. The increased activity of the thyroid during pregnancy may be the cause of the improvement, as undoubtedly an increase in the function of the thyroid gland, or the administration of thyroid, stimulates metabolism. Two of the cases were treated with benefit by thyroid extract prior to pregnancy, and the other two have had no treatment. All the cases are typical of the disease, and three of them appear to be otherwise healthy, while the fourth suffers from myxoedema. The myxoedema also improved during each pregnancy.

Signs and Symptoms of Psoriasis.

A well-developed case of psoriasis is very distinctive. The situation of the lesions and the silvery appearance of the scales leave little room for doubt as to the nature of the disease. The disease first appears as a reddened and scaly papule. There may be several of these scattered over the extensor surfaces of the limbs. If the disease extend, the papule grows at its circumference and

may extend until the diameter measures from half to two inches, or is even larger. The different appearances found in advanced cases are due to a coalescence of the extending borders of the initial papules, or to the natural cure of the disease. When involution of the disease commences, the centre of the patch first clears up, and as this advances the annular form results. The disease may be arrested at any stage of its growth, and hence the different forms the patches may assume. When the hair follicles are alone affected, the lesions tend to remain small. The scales may vary much. In some cases they may only become evident on scratching, while in others they may be heaped up and so are termed rupioid psoriasis. The amount of accumulated scales modifies the colour of the patch from a bright red where they are few to a silvery white where they have remained adherent. If the heaped-up scales are removed, the red base is disclosed. Usually the scaliness is most marked on the knees, elbows and scalp. The patches on the scalp may be yellowish when ~~at~~ undisturbed, but gentle scraping of the edge will show their distinctive characteristics.

The position of the disease alters the appearance. If the nails are affected, they become brittle and may split, are thickened, furrowed and pitted. The colour varies, but is usually of a brownish tint and there is an absence of lustre.

The whole nail may be affected, or only a part.

If psoriasis is limited to the palms and soles, the scaly patches may be absent, but the horny layer is thickened in parts and has a worm-eaten appearance. A similar appearance may be due ~~ye~~ to syphilis.

The unaffected parts of the skin show no change.

The secondary complications of psoriasis are rare. Fissures may be found near joints, as the wrists and fingers. Scarring and keloid have been noted, and even warts and epithelioma. Several cases of pigmentation have been recorded, many of these following the use of arsenic. A widespread case of psoriasis may be followed by pityriasis rubra.

The symptoms are variable; there is usually itching at the acute stage, though it is seldom severe. The general health may be well maintained, though this is not always so.

Pathology.

There is a proliferation of the connective tissue cells in the papillae, with some oedema and dilatation of the capillaries. The papillae appear nearer the surface and there is a downward growth of the interpapillary part of the epidermis. The cells of the stratum mucosum are increased in number, and the intercellular channels are

widened and contain a few leucocytes. The granular layer is partially lost and the horny cells retain their nuclei and protoplasm. In the scales, leucocytes and blood may be found. These are believed by some to be dry abscesses, and are claimed to be the primary lesions. Different organisms have been described as pathogenic, but these claims have not as yet been proved. ⁽¹⁾ Whitfield remarks on the absence from the scale of all the common micro-organisms affecting the skin, and this also applies to scales taken from the scalp. He holds that this is a perfect diagnostic distinction between psoriasis and suborrhoeic eczema or pityriasis alba.

Some authors maintain that the disease starts with a congestion of the capillaries of the papillae, with a subsequent cellular extravasation and enlargement of the papillae. This gives rise to increased activity of the palisade and lower layers of the rete malpighii, and so corresponds to a chronic inflammation. Others are of opinion that the first pathological change is found in the rete malpighii. There is a hyperplasia and proliferation of the cells of this layer, and as these increase the rete thickens, most markedly in the interpapillary spaces, and their downward growth leads to an apparent elongation of the papillae. These observers maintain that the changes found in the papillae are secondary.

The evidence of the various observers is in favour of the disease commencing in the epidermis. Robinson, ⁽²⁾

(3) Jamieson and Thin hold this view. (4) Crocker, while (5) unable to confirm this view, cannot prove the contrary. He did not find a hyperplasia of the rete apart from cell effusion of the corium, nor the cell (6) effusion apart from hyperplasia of the rete. Unna considers the first change is in the horny layer, with parakeratosis and epithelial growth.

Diagnosis.

In a well marked case no difficulty can arise in diagnosis. The silvery appearance of the scales on a raised, reddened base, together with the symmetrical distribution of the disease on the extensor surfaces of the limbs, and especially on the elbows and knees, can leave little room for doubt. Should the characteristic appearance of the scales not be at first visible, it can be brought into view by gently scraping the patch. There is no discharge throughout the whole course of the disease.

If the disease is not fully developed, there may be some ~~little~~ difficulty in distinguishing it from ringworm, lupus erythematosus, pityriasis rubra, eczema, lichen, syphilis, and seborrhoea.

Differential Diagnosis.

From ringworm. In tinea circinata there is no symmetrical distribution of the disease, the patch may appear anywhere on the body. The hair follicles are specially attacked, the hair is brittle and is broken off near the surface of the skin. The scales are not heaped up as is psoriasis. A microscopical examination will remove all doubt.

From Lupus Erythematosus. Lupus erythematosus affects the face, where psoriasis is seldom seen, and if there it may be found on other parts. The scales are scanty and the edge more raised. On raising the scales, small processes will be found extending into the sebaceous follicles. On the scalp, lupus erythematosus destroys the hair, while psoriasis does not. After recovery from psoriasis, the skin shows no trace of the disease, whereas lupus is always followed by more or less scarring.

From Pityriasis Rubra.

Difficulty is apt to arise in a case of acute psoriasis that becomes universal. The case may pass from psoriasis on to pityriasis, and it may be impossible to definitely classify the disease at certain stages of the transition. The subacute and chronic cases take months or even years to become what is regarded as universal, though there are always some intervals of healthy skin present. Pityriasis spreads more rapidly than psoriasis and becomes really universal and is accompanied by great prostration. The scales in pityriasis are larger than those of psoriasis and never form crusts.

From Eczema. The dry form of eczema alone can cause a difficulty in diagnosis, and as a rule a history of discharge can be got. The border of the patch in psoriasis is sharply defined, while that of eczema fades gradually into the healthy tissue. The crust of psoriasis is composed of scales, that of eczema of dried inflammatory exudate with

few scales; and the latter is of a brownish colour and not silvery white. On removing the crust of psoriasis, the base is dry, except for some blood; but in eczema there is a serous discharge. Eczema is found on the flexor rather than on the extensor surfaces of the joints.

From Lichen Planus. Lichen planus is most frequently found on the flexures of the wrist and the inner side of the knee. The papules are angular in shape and of a livid hue, with a flat, shining surface, in contrast to the round, red and scaly papule of psoriasis. The patch in psoriasis is formed by a spread from the edge of the papule, while that of lichen is formed by many papules coalescing to form a patch. Near the margin of the patch, separate papules may be seen. Lichen leaves a stain after treatment, while in psoriasis a stain may remain if arsenic has been used.

From Syphilis. The secondary and tertiary lesions of syphilis may be mistaken for psoriasis. The secondary are to be distinguished by the site of the lesions, the trunk is usually affected and not the limbs. The patches are small, varying up to half an inch in diameter, and do not tend to enlarge at the periphery. The base of the patch is brownish, in contrast with the red of psoriasis. The scales are scanty and dirty-looking, and after the removal of the scales of a doubtful patch, there is always the feeling of a solid new formation imparted to the finger that never fails to distinguish syphilis.

There is in addition other evidence of syphilis, as
 sore throat, enlarged glands, iritis; and the blood
 might be examined by the complement deviation test.
 (Wasserman)

In the tertiary stage the patches are not so
 symmetrically arranged, nor are they often on the
 usual sites of psoriasis. The edge of the patch is
 more raised, and the scales are of a grayish colour.
 The one distinctive difference is that a scar is
 left in syphilis but not in psoriasis.

From Seborrhoea. Unna and his followers maintain
 that the difference between seborrhoea and psoriasis
 is only one of degree, but this is not generally ac-
 cepted. On the scalp psoriasis may be found in
 patches, while seborrhoea generally extends all over.
 Where psoriasis is all over the scalp, its dis-
 tinctive characters can be easily made out at the
 limits of the hairy part. In seborrhoeic dermati-
 tis no difficulty arises in the moist form, while in
 the dry form a distinction can usually be made by
 the yellow colour and greasy nature of the scales.

The etiology of psoriasis is still unknown. The
 action of arsenic in a spreading case might point to
 some derangement in metabolism as a possible cause,
 and this view is supported by the effect of thyroid
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 noticed by Bramwell at the commencement of treat-
 ment and by Crocker when thyroid was given in a
 developing case. The marked spread of the disease
 at the early stage of pregnancy in cases II, IV and
 V is in agreement with the effect of thyroid. What-

ever would produce a disturbance of the metabolic process might be followed by psoriasis. Psoriasis developing after violent mental emotions may be explained in this way. A toxaemia so set up may produce the appearances on the skin much in the same manner as is seen in the exanthemata or urticaria due to intestinal disorder. The parasitic theory will not explain cases II, IV and V, unless pregnancy renders the tissues more suitable for the growth of the organism during the first weeks and then afterwards ^{they} become unsuitable. In case IV and the two cases of Bulkley, where psoriasis spread at the menstrual period, ^{it} can be accounted for by supposing the disease due to a toxic agent rather than to a change in the tissues. The distribution of the disease alone would indicate that a specific local organism was not the only cause, but that there must be some disturbance in the general system to account for the more or less bilateral appearances presented. The disturbing cause may act directly on the nervous system and so explain the distribution.

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Gowers has reported three cases where psoriasis followed the internal administration of borax for prolonged periods for epilepsy, and he suggests some etiological relation between them. Others have had a similar experience. To explain the causal relation between the administration of borax and psoriasis, it must be remembered that borax is not rapidly eliminated, and consequently an accumu -

lation takes place if sufficiently large doses are given, and may lead to chronic poisoning. When borax in sufficient doses is given by the mouth, signs of gastro-intestinal irritation usually first appear, and later the skin eruption. If borax --- had any causal relation with Gowers' cases, it is more likely that it acted by disturbing the function of the cells lining the alimentary tract and so admitting to the blood some toxic substance, than by altering the nature of the skin and making it in symmetrical areas a suitable soil for the growth of some specific organism. If the skin were altered, then psoriasis would not be so likely to limit itself to the extensor surfaces.

Gout and rheumatoid arthritis are considered to be important factors in the production of psoriasis, and though they may not be causally related, they may all be due to toxins. A faulty metabolism is at least an important cause of gout, though it may be uncertain how far the accumulation of uric acid is due to errors of metabolism rather than excretory defects.

Rheumatoid arthritis is often associated with psoriasis. This disease has frequently dyspeptic symptoms, pointing to some agent interfering with proper assimilation. This probably leads to a toxæmia, as shown by the muscular weakness that
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precedes the joint affection. Macalister has

noted a considerable number of cases with enlarged thyroid, and this he thinks is an attempt to get rid of the toxin from the system. He finds that the administration of thyroid often benefits the disease. Now, if rheumatoid arthritis is due to a toxæmia affecting primarily the nervous system, this may explain its frequent association with psoriasis, on the assumption that the latter is also in part due to a toxin.

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Bulkley is inclined to consider excessive ~~excessive~~-meat eating as a factor in many cutaneous diseases, and in psoriasis he believes that prolonged abstinence from meat is often attended with a practical freedom from the eruption. He considers the cause lies in an imperfect nitrogenous metabolism. This view may explain those cases that benefit with thyroid treatment.

Whatever may be the cause of psoriasis, it appears to be influenced by other conditions. The eruption is said to become worse during the spring, and the disease is more common in cold climates. It may disappear during the summer and return in winter, though this order may occasionally be reversed and the disease become worse during the warm weather.

Frequently more than one of a family are affected. In cases IV and V there is the history of three generations affected, and in the other cases there are two members affected in one family and three in the other. These point to tissue pro-

clivity rather than cases of direct infection.

Against a theory of infection, it is rare to have all the members of the family affected, though several cases have been reported as due to infection.

The attempts at inoculation have not been conclusive, though Destot⁽¹¹⁾ suffered from the disease a fortnight after inoculating his arm.

In predisposed subjects any depressing influence may lead to an attack. Psoriatic women may have an attack determined by parturition, lactation, or menstruation, and in case V the disease reappeared⁽¹²⁾ at the commencement of each pregnancy. Bulkley records two cases in married women aged 36 and 42, where new patches of psoriasis developed and old patches became worse just before and during menstruation. This might indicate that some ovarian disturbance was ~~seen~~ one of the causes of psoriasis, or that the thyroid might not be acting ^{efficiently} properly and might have an effect on the metabolism. The thyroid is often, if not always, enlarged during menstruation. In case IV and in Bulkley's cases where the psoriasis became worse during menstruation, this would point to some disturbance caused by a change in the function of the ovaries or thyroid.⁽¹³⁾ Bell and Hick maintain that both glands have a similar action on the menstruating and pregnant uterus, causing expulsive contractions. Now it might be fairly assumed that the internal secretion of the ovary is arrested at the time of the liberation of the ovum and perhaps during a portion of the pregnancy. The

enlargement of the thyroid during menstruation and the early period of pregnancy may be to compensate for a deficit of ovarian secretion and so prevent a disturbance of the general metabolism.

The cases recorded here tend to show that during pregnancy the disease disappears. This is supported by the opinion of Whitfield,⁽¹⁴⁾ that "it usually disappears during pregnancy."⁽¹⁵⁾ Crocker states that psoriasis may clear up during pregnancy. Cases II, IV and V became worse during the first month of pregnancy, when it might be assumed that the ovarian secretion was in abeyance, and before the thyroid had time to hypertrophy and make up for the loss of the ovarian secretion. The cases improved from the first month of pregnancy, after a probable balance had been established between the functions of the thyroid and ovary, or it may be that the ovarian secretion had increased. In Case I both the myxoedema and the psoriasis improved during the different pregnancies. The psoriasis was later in disappearing than in the other cases, but this might have been expected if the thyroid had any action in producing the change. There can be no doubt that the myxoedema was influenced by the thyroid, thus showing there was more secretion during pregnancy. The symptoms of myxoedema have been noticed to disappear

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during pregnancy by Osler and Murray. Murray accepts the suggestion of Dr. Hector Mackenzie that this is caused by the mother absorbing the secretion of the thyroid of the foetus. This suggestion will not account for the improvement in Case I, as there was a distinct feeling of better health very early in pregnancy and long before the thyroid of the foetus could possibly secrete sufficient to have any practical effect on the mother. The thyroid, it must be remembered, is developed from hypoblast and does not appear until about four weeks after fertilization. It could hardly be expected that a secreting surface would have an effect on the mother until the growth of the gland was well advanced. The lateral lobes are supposed to separate from the visceral clefts about the sixth week. By this time there was a distinct improvement in the myxoedema and psoriasis. It is generally admitted that the thyroid of the mother is enlarged early in pregnancy, and so it seems more reasonable to attribute the improvement in the myxoedema to the action of the maternal thyroid than to that of the foetus.

Treatment.

In the treatment of psoriasis many drugs have been employed, and often the best result is obtained by a combination of internal and external remedies. Of the former, arsenic is most frequently used. This acts best when the disease is in a chronic stage and when the digestive organs of the patient are sound. How arsenic acts is not known, but

probably the good it does may be due to stimulation of the skin; or it may act indirectly by improving the general health. Crocker recommends a removal of any cause tending to lower the general tone of the system, before any specific treatment is adopted and then he adds: "In a large number of cases thus treated, the eruption is removed without any occasion for specific treatment." Dr. Durward Brown, Harrogate, informs me that he has had several cases of psoriasis with muco-membranous colitis, and that the psoriasis disappeared during treatment for colitis by the Plombières internal douche. These results might be due to improvement of the general health, or more probably the removal of some toxin. The good results obtained by arsenic might be due to an increase in the metabolism. In toxic doses there is an increase in the metabolism, as shown by an increase in the urea, and this may have an influence on the psoriasis.

Against this, there is an undoubted benefit got from the use of small doses of arsenic, and it is stated that small doses lessen the excretion of
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nitrogenous waste products. Hale White doubts the accuracy of this statement, "as the methods of investigation hitherto adopted are not quite accurate
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nor free from experimental error." Walker suggests that arsenic, continued after toxic symptoms have supervened, apparently cures psoriasis, but the vitality of the general system is lowered and with it the disease. As soon as the drug is stopped,

the general health improves and the psoriasis returns. It is more likely that the arsenic has removed the psoriasis and when the system has returned to its previous condition the disease develops afresh. It must not be forgotten that arsenic may have a special influence on the nerves to the extensor aspects of the limbs, as it is the nerves of these regions that are paralysed in chronic poisoning. The action of arsenic on the nerves may stimulate the skin and so restore it to a normal condition. Stimulation of a chronic disease appears a rational proceeding and one likely to be followed by good results, while on the other hand acute diseases of the skin improve with soothing treatment. Such is the course usually adopted if external remedies are applied.

Salicin is of greatest service in the acute cases, where arsenic is to be avoided. Crocker, who was the first to recommend salicin, believes it acts as a microbicide in the blood, being there split up into salicylic and carbolic acid. As the same results are obtained with salicylate of soda, the action of the carbolic acid may be put aside and the results attributed to the salicylate. In addition to its action on bacteria in the blood, salicylate would act as an antiseptic in the alimentary canal and prevent decomposition and the formation of toxins. Salicylate increases the excretion of urea and uric acid, and this may at the same time

remove any toxin present. The drug may however have a soothing effect on the skin by increasing the sweat secretion, and so act locally.

Thyroid has given good results in many cases, though it is not extensively used. In Cases I, II, III, the psoriasis was benefited by its use. No other drug was used at the time, and no change was made in the mode of living to affect the result. In the case of myxoedema this might be expected, as whatever would benefit the general health might aid in removing a localised disease. This will not explain cases II and III, as in these thyroid was tried on empirical grounds. They were in good health, and there was no apparent reason for selecting one drug in preference to another. The results prove that thyroid removed the psoriasis directly in two of the cases, and possibly also in the other. Morris states that "thyroid extract has not answered the expectations that were formed of it; it sometimes does good, but more often does harm." (20) Byrom Bramwell holds the opposite view and maintains that his results show that the majority of his cases have benefited by thyroid if given in sufficient doses, and he urges that the treatment should be pushed, even though thyroidism result. He compares it with the action of iodide in syphilis. Syphilis is no doubt due to infection with an organism, but there is no such certainty as to the cause

of psoriasis. As the iodide is of greatest value in the tertiary stages and acts best after or in conjunction with a course of mercury, its specific action may be limited to its effect on the toxin, and the mercury alone may attack the organism. Crocker has used thyroid extract largely and found in a "limited number of cases its action is often both efficacious and rapid". He also noticed that in developing psoriasis there is often a rapid
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extension of the disease. Walker admits that thyroid extract will cure psoriasis, but objects to its use as a routine treatment, owing to the risks incurred and the fact that if it is to have a thorough trial the patient must remain in bed. The conclusion may be drawn that the administration of thyroid has a distinct influence in many cases of psoriasis.

Two of the cases reported as improved with thyroid treatment also got well during pregnancy, without treatment. Was this improvement due to an increase in the activity of the thyroid? It is generally admitted that the thyroid does enlarge
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early in pregnancy. Playfair, writing on the signs of pregnancy, mentions that "authors have thought the occurrence of conception might be ascertained by certain obscure signs such as - - swelling of the neck." This no doubt would be due to enlargement of the thyroid. In the case of myxoedema there must have been an increase of the function of the thyroid, as this alone could produce the

feeling of well-being experienced so early in the pregnancy. In cases II, IV and V, the disease, after conception, first spread, and this appears to correspond with the observations of Bramwell, who ⁽⁷⁾ often noticed that the patches became more numerous and more marked at the commencement of treatment with thyroid. If this initial spread during pregnancy ^{be} ~~were~~ due to an increase of thyroid secretion, it is more likely to come from the thyroid of the mother than from that of the foetus as Mackenzie suggests. In Cases I and II the disease returned about a month after parturition, but as these cases got worse after the cessation of thyroid by the mouth, this would indicate that the improvement during pregnancy was due to an increased activity of the thyroid gland. Cases IV and V were affected for the first time when 5 or 6 years of age. In Case IV the disease never entirely disappeared until the first pregnancy, and then returned at the commencement of the others. In Case V (a sister of Case IV) the disease was absent for three years before her first pregnancy and has returned with each succeeding one. Since the last confinement the psoriasis has returned, ^{in case IV.} though she is not pregnant. Both appear to be in good health, except for constipation in Case IV.

The spread of the disease in Cases II, IV

and V at the commencement of the successive pregnancies may be accounted for by a disturbance in the metabolism, and this might be corrected by the increased function of the thyroid as the pregnancy advanced.

The inference to be drawn from the four cases is that the function of the thyroid ~~is~~ ~~that the function of the thyroid~~ is increased during pregnancy and the increased secretion leads to a cure of psoriasis. The administration of thyroid has been found to affect the metabolism of the body. There is an increased absorption of oxygen and exhalation of carbonic acid. The urea excreted has been found to be increased, both in (22) the healthy and myxoedematous. Ord and White found that the amount of nitrogen excreted by the urine exceeded that of the ingesta, and this observation has been confirmed by others. Leopold Levy and Rothschild have noted that rheumatism, megrim and asthma have been improved during pregnancy, thus indicating that pregnancy may stimulate the excretion of toxins. These may illustrate the improvement of psoriasis in pregnancy and are all probably due to one cause, the increased activity of the thyroid.

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Bell and Hick have observed clinically that in most cases of exophthalmic goitre where there is an excess of thyroid secretion the blood calcium index is low. Experimentally they found that on removal of the thyroid from cats the

calcium index increased. In one of their experiments, castration was performed after the symptoms of myxoedema had set in, and within three days the animal became "quite active and bright." In this case the calcium index had not increased so much as in the other experiments, rising from 0.3 to 0.4 before castration, and after it rose to 1.0. Perhaps in this case some portion of thyroid may have been left. The same authors have also noted a marked fall in the calcium index in the systemic blood of the human subject just before the menstrual bleeding occurs. A distinct rise is noticed prior to the onset of menstruation - in one case a rise from 1.4 to 3.5 and then a fall just before the menstrual flow to 0.4. In another the index rose from 1.0 to 1.2 and then, accompanied by a sudden profuse bleeding and vomiting, fell to 0.2. They also believe that the internal secretion of the ovary has the property of depleting the blood and tissues of calcium salts. The excess of calcium loss during lactation may be an explanation of amenorrhoea during lactation. The view of Bell and Hick indicates that the ovaries and thyroid affect metabolism in one particular direction and appear to be specially active just before the onset of menstruation.

The effect of calcium was tried on the following case of psoriasis.

L.R., aged 35 years, is occupied as a chauffeur.

He has had a widespread psoriasis since he was 16 years of age, over the extensor surfaces of the forearms and legs and also in discrete patches on the back. About 12 years ago he contracted syphilis and was treated for about a year. There are no tertiary symptoms, and his child, born in February, 1910, shows no signs of the disease. In December, 1909, he was engaged paving for about a week and two boils developed on his back, one on either side of the spine, about the level of the twelfth rib. These were probably due to friction while doing work he was unaccustomed to. When the boils began to heal, he was put on 8 grains of calcium iodide a day. The psoriasis at once began to spread, and on the drug being stopped the spread ceased and the disease resumed its usual chronic character. In May, 1910, thyroid extract was given and the psoriasis gradually disappeared. Towards the end of August, the patches were limited to the elbows and knees. This case indicates that thyroid acts by excreting from the system at least one of the causative factors of the disease.

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Jacobi maintains that urea is generally increased before the appearance of the menses and falls during and after, thus corresponding with the results of Bell and Hick.

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Allbutt and Rolleston mention that in myxoedema a great fall in nitrogen excretion is noticed, to

as low as 8 or 9 grains a day. If thyroid is given in these cases it is increased and may for a time exceed the normal. In exophthalmic goitre the amount of nitrogen excreted varies with the severity of the disease. They suggest that the action of thyroid in cases of psoriasis may be "to neutralise some poison formed in the body, possibly as the result of metabolic processes."

The success of thyroid treatment may be due to an increase in metabolism and to an elimination of some toxin, or, as seen in cases of myxoedema, its action may be due to an influence in trophic processes of the skin. It can scarcely be expected to have any action on bacteria that may be the cause of the disease. The success or failure of the treatment may depend on the condition of the thyroid of the individual, that is, success may follow if psoriasis is a manifestation of an affection of the gland, or failure may indicate that there are other causes at work besides a defective metabolism.

Many agents have been employed for the local treatment of psoriasis. These are selected according to the condition of the disease at the time of application. Generally the more acute the case the milder the remedy, and in the chronic cases more stimulating drugs are used. In acutely hyperaemic conditions, soothing applications such as calamine may cure. This cannot act as an antiseptic on any organism, but it does reduce the hyperaemia and so allow the cells of the skin to

return to normal. On the other hand, in chronic cases tar and chrysarobin are most frequently used. Both are antiseptic and stimulating. If they acted by virtue of their antiseptic properties, benefit might be expected to follow in the acute cases as well as the chronic; but this is not so. This might be looked for especially if psoriasis is due to bacteria acting locally. Consequently the conclusion is that the stimulation of the cells of the skin gives the good results.

X rays have lately been used in
(26)
psoriasis. Morris and Dore report several cases cured by 3 to 5 exposures of ten minutes. They mention that many others have had similar results. This improvement is probably due to the stimulating action of the rays when given in small doses, and not
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to their action on bacteria. Macleod considers that the rays have a stimulating effect on the skin when given in small doses. This view is supported by Pusy^e in "The Journal of Cutaneous Diseases", 1903. Beck holds that they act in much the same way as a burn, the first degree producing a hyperaemia, and the last destruction of the part. The effect of the rays on psoriasis is probably due to stimulation of the skin, and not to an arrested growth of
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bacteria. Wolfenden and Ross found that the growth
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of cocci and bacilli was not affected by X rays, while Rieder found that cultures of anthrax, tubercle, cocci and others were either absent or

feebly developed in the exposed part of the plate.
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Belot explains this divergence of opinion by the strength of the exposures, and points out that an exposure necessary to kill bacteria is greater than the maximum dose used in radiography. This does not prove that psoriasis is not due to an organism, as the exposures given might be sufficient to overcome some organisms, though not to have any effect on the known organisms that affect the skin. In ringworm of the scalp and favus, X-ray treatment does not destroy the organism of the disease, but only removes the hair and allows the germicide to act more effectually. The stimulation to the tissues may be sufficient to allow the skin to return to normal, or the increasing activity of the cells may lead to destruction of a possible organism. Allen treated one case by using X rays to one hand and medical means to the other. That under the rays was cured, and not the other, showing that the effect was local. Dr. Waters of Sunderland exhibited a case at the Infirmary in February, 1910, where arsenic was given and the right arm alone was under treatment by the X rays. The disease was gradually disappearing from the left arm, while the right arm was practically clear. The rays would stimulate the cells of the skin, and this would of itself tend to restore the skin to a normal condition, especially when it is kept in view that psoriasis is essentially a chronic

disease and that the length of exposures cannot be sufficient to destroy bacteria.

The results of the different forms of treatment indicate that the disease might be due to a toxic rather than an organismal cause. The internal remedies point to toxic cause, if a common explanation is to be given to all the agents. Thyroid treatment cannot be expected to act as a germicide, though arsenic and salicin might so act. On the other hand, arsenic may benefit by its influence on metabolism, and salicin might either eliminate the toxin or prevent decomposition by bacteria in the intestine, and especially prevent splitting up the proteid molecule before absorption. The action of the other drugs usually employed may be similarly explained. Mercury probably acts as a disinfectant of the intestinal tract, while the acetate and iodide of potash acting as diuretics would eliminate a toxin.

Several of the external remedies at first sight seem to benefit the disease in virtue of their germicidal properties, though there is no direct proof that this is the case. Chrysarobin and tar undoubtedly destroy bacteria, but the same cannot be said of the milder remedies, as calamine. The drug for the particular case is selected because of its soothing or stimulating action, and not on account of its antiseptic properties. X-ray treatment may benefit the same cases as chrysaro-

bin and tar, and yet the result is probably not due to the destruction of any organism.

If, however, the remedies benefit the disease because of their stimulating properties, then it is easier to understand how the same result may follow the different applications.

Conclusions.

1. Thyroid extract does benefit psoriasis.
2. Psoriasis may improve during pregnancy, probably owing to an increased activity of the thyroid, and possibly the ovary may have some influence.
3. A disturbance of metabolism is an important causal factor of psoriasis.
4. The results of treatment indicate that toxæmia is probably a cause of psoriasis, and not bacteria situated in the skin.
5. The distribution of the disease points to a toxin affecting the nerves, rather than a blood infection.

Cases.

1. Mrs. F. Myxoedema and Psoriasis. - Thyroid treatment.
2. Mrs. B. Psoriasis. Thyroid treatment.
3. Miss J. Psoriasis. Thyroid treatment.
4. Mrs. D. Psoriasis. Untreated.
5. Mrs. J. Psoriasis. Untreated.

Cases.

I. Psoriasis with Myxoedema; both benefited by treatment with thyroid extract and by super-vention of pregnancy.

Mrs. F., aged 45 years (in 1910), suffered from psoriasis. In August, 1904, there was a patch about two inches by one inch on each elbow, and a somewhat larger patch on the knees. On the extensor surfaces of both arms and legs there were a number of spots that varied from a papule to $\frac{3}{4}$ of an inch in diameter. These areas were covered with silvery scales, situated on a reddened base. On scratching, the scales were easily removed, and small spots of blood appeared.

The patient, in addition to psoriasis, suffered from myxoedema. The thyroid was markedly enlarged, but on palpation felt firmer than the enlarged thyroid of exophthalmic goitre. The skin was dry and rough. The face was yellowish, with the typical pink flush on the cheeks, and the eyelids were swollen, but did not pit on pressure. The lips were purple and swollen. Her speech was slow, and she complained of weariness and inability to do her usual household duties. The temperature was normal, and she did not feel cold.

The treatment consisted of $2\frac{1}{2}$ grains of dried extract of thyroid a day, afterwards increased to 5 grains a day. Her general health improved and she became much brighter, and in the course of two

months all signs of psoriasis had gone, except small patches on the elbows and knees. She then ceased the treatment, and the psoriasis gradually spread to about its former extent.

About eight months later she became pregnant. She at once felt better in health, and between the third and fourth month the patches of psoriasis were limited to the elbows and knees, with one or two of the annular forms on the extensor surfaces of the limbs. At her confinement in March, 1906, no trace of the disease was seen. About a month afterwards, her former wearied feeling and the other signs of myxoedema, together with the psoriasis, returned, to yield to thyroid treatment; but a relapse occurred as soon as the thyroid was stopped. The patient was not seen until August, 1909, when she was in much the same condition as when first attended. She was not treated.

In January, 1910, the psoriasis was very similar to what it was at the fourth month of her previous pregnancy. In May the elbows and knees were only reddened and had no scales. The rest of the limbs were then free of disease. The confinement took place on the 27th. of June. The skin then appeared normal. On September 1st. there was a patch of about one inch in diameter on the elbows and knees.

Former History. She has had eight children, and there are no signs of syphilis. The psoriasis began after the birth of her fourth child, when she was 32 years of age. She noticed that she was better in health, and that the psoriasis disappeared, when pregnant with the fifth and sixth child. She nursed all her children. She has always been in poor circumstances and has had often a small allowance of food.

Family History. Her father was healthy and her mother probably tubercular. She has a brother who suffers from psoriasis but is otherwise healthy. These two are the youngest of the family. An elder sister has an enlarged thyroid that is functionally active, as her symptoms point to exophthalmic goitre.

II. Showing the beneficial effect of pregnancy on psoriasis.

Mrs. B. - aged 35 years -- 2 children.

When she was 14 or 15 years of age, psoriasis appeared for the first time. No treatment was tried until 1905, when thyroid extract was given. She was given from $2\frac{1}{2}$ grains to $7\frac{1}{2}$ grains a day of the dry extract. A distinct improvement took place, but as she would not rest in bed the dose was not increased. After the treatment was stopped, the disease gradually returned. There were large patches on the knees and elbows and various-sized patches on the extensor surfaces of the limbs. The back and front of the trunk had each four or five patches, and several of these were annular.

In 1906 she was married, and at the commencement of her first pregnancy the disease became rapidly worse for the first month and then gradually faded away. By the time of the birth of the child (stillborn), the disease had disappeared. About a month later psoriasis was noticed to return and progressed until the second pregnancy. It followed a similar course to that of the first pregnancy. She has not been treated for psoriasis since her marriage.

Mrs. B. appears to be otherwise in good health.

Family History. A brother and sister suffer from psoriasis. The sister's case is reported (Miss J. - Case III). The brother was treated with arsenic, as the small doses of thyroid given did not affect the disease and it was not advisable to push the treatment while he was at work.

III. Showing the beneficial effect of thyroid extract
on a case of Psoriasis.

Miss J. - aged 30 -- unmarried.

This is a sister of Mrs.B.(Case II).

Like her sister, she began to suffer from the disease when she was about 15 years of age and has varied from time to time, but she had never been free from it. The limbs were affected to a less extent than her sister's, and she had only two or three patches situated in the lumbar region. She was treated in 1905 with thyroid extract and was cured. She was seen again in 1907, when the disease had returned to much the same condition as it was in in 1905. The treatment on this occasion consisted of thyroid extract and arsenic. The disease returned in 1909, when it was very much the same as when first attended. During the first week of the treatment, on both occasions, the skin around the patches became red, though the scales did not appear to extend.

IV. Showing the beneficial effect of pregnancy
on Psoriasis.

Mrs.D. - aged 24 years - 4 children.

She has suffered from psoriasis since she was 5 years of age. The disease was noticed to become much worse at the commencement of the first pregnancy, and then gradually faded away before the confinement in 1905. A similar course was noticed during the second pregnancy, which terminated in July, 1907. The same happened with the third pregnancy. At the confinement in July, 1908, I noticed no signs of psoriasis, but as I was unaware of the disease at the time, small patches might have been unobserved. She nursed the third child for about a year, and it was not until a year and seven months after the confinement that menstruation returned. During this period she was poorly fed. With the return of the menses in February, 1909, the psoriasis reappeared. In April the disease on the arms consisted of a large patch on each elbow and several patches scattered over the extensor surfaces, between the insertion of the deltoid and the wrist. These varied in size from a papule to about half-an-inch in diameter. Though menstruation did not return in May, she did not consider herself pregnant. The psoriasis was improving, and by June, when pregnancy was undoubted, the scattered patches had nearly all disappeared. In August only small patches were visible on the elbows. At her confinement, on January 14th., 1910, a careful in-

spection revealed no trace of psoriasis. This patient was seen during the last week of March, 1910, when about a dozen papules of psoriasis were visible on the extensor aspects of each arm. Early in May several of the spots were of an inch in diameter and many fresh papules were present. During this period she suffered from constipation, and after treatment with cascara sagrada and pulvis glycyrrhizae compositus the disease gradually disappeared in the course of three months.

Family History. Her paternal grandmother suffered from a similar disease, and it was thought to be hereditary. An aunt and several of her children are affected. One of Mrs. D's. sisters suffers from psoriasis (Case V).

V. Showing the varying effects of pregnancy on Psoriasis.

Mrs.J. - aged 30 - 3 children.

Mrs.J. is a sister of Case IV.

The disease first appeared when she was six years of age. Its extent varied from time to time, but it always got worse in the spring. When she was about 19 years of age, it disappeared for about three years and returned about three weeks after her marriage. This corresponded with the commencement of her first pregnancy. About a month later the disease began to fade, and it entirely disappeared between the third and fourth month. Her first child was born in 1902, and the second in 1903. The disease returned in the second as in the first pregnancy. During 1907 psoriasis returned, and some advertised remedy was tried. What this consisted of is unknown. Purgation was produced and an abortion followed. The psoriasis disappeared. A similar course was followed during her ^{fourth} ~~third~~ pregnancy in 1909. In November 1909 Mrs.J. considered herself pregnant, as the psoriasis had returned and menstruation had not occurred since October. By February, 1910, the disease had gone, except patches of an inch in diameter on the elbows and knees. On April 30th. no trace of the disease could be found. The confinement took place on July 24th., when the skin appeared normal.

The disease has always been limited to the extensor aspects of the limbs. When at its worst, the surfaces were almost completely covered by the

different coalescing patches. Mrs.J. is otherwise in good health and has nursed all her children.

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